PB-217 768

WATER POLLUTION CONTROL TRAINING PROGRAM. BULLETIN OF COURSES, JULY 1967-JUNE 1968

Federal Water Pollution Control Administration
Washington, D. C.

22 January 1973

DISTRIBUTED BY:

NTIS

National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

PB 217 768

Water Pollution Control Training Program

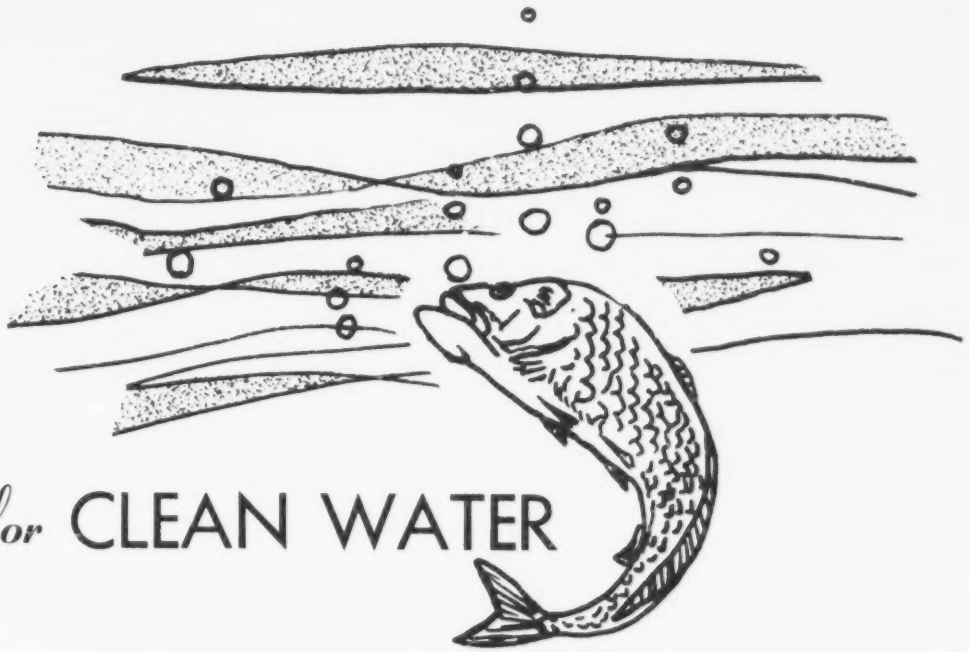
BULLETIN OF COURSES

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. Department of Commerce
Springfield VA 22151

July 1967 to June 1968

U.S. DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration



Training for CLEAN WATER

Let us proclaim a creed to preserve our natural heritage with rights and the duties to respect those rights:

The right to clean water—and the duty not to pollute it.

The right to clean air—and the duty not to befoul it.

The right to surroundings reasonably free from man-made ugliness—and the duty not to blight.

The right to easy access to places of beauty and tranquility where every family can find recreation and refreshment—and the duty to preserve such places clean and unspoiled.

The right to enjoy plants and animals in their natural habitats—and the duty not to eliminate them from the face of this earth.

President Lyndon B. Johnson
Message to the Congress,
February 23, 1966

U. S. Department of the Interior
Federal Water Pollution Control Administration
Robert A. Taft Sanitary Engineering Center
Cincinnati, Ohio 45226

We are pleased to send you this Water Pollution Control Training Program Bulletin of Courses for Fiscal Year 1968. Undoubtedly many professional and technical people would be interested in these training opportunities if they knew about the courses offered at the various water laboratories of the Adminstration. We will be pleased to send the Bulletin to any friends or associates who you think will be interested in this information.

Detach the convenient postcard below, use name of organization, business address, and include zip code.

I. Bernstein, Acting Chief
Training Program

Water Pollution Control Training Program

Please send FY 1968 Bulletin of Courses to the following:

_____
_____
_____
_____ **Zip**

_____
_____
_____
_____ **Zip**

_____
_____
_____
_____ **Zip**

BULLETIN OF COURSES

July 1967 to June 1968

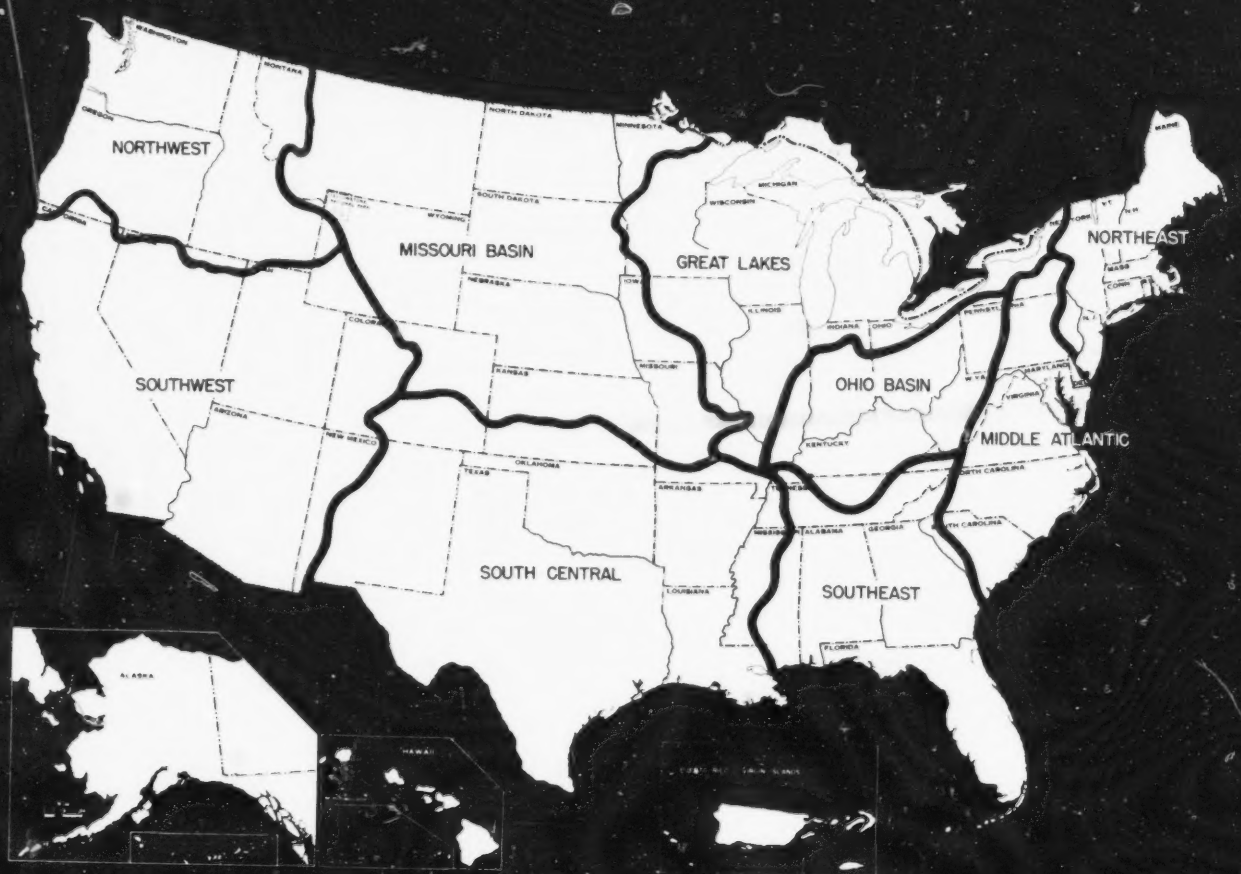
BULLETIN OF COURSES

Water Pollution Control Training Program

Details of illustrations in this document may be better studied on microfiche.

U.S. DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION REGIONS



FEDERAL WATER POLLUTION CONTROL ADMINISTRATION REGIONAL OFFICES

NORTHWEST REGION

Alaska, Idaho, Montana,
Oregon, Washington

Regional Director, FWPCA
Room 570, Pittock Block
921 S.W. Washington Street
Portland, Oregon 97205
Area code 503: 226-1915

SOUTHWEST REGION

Arizona, California, Hawaii,
Nevada, Utah, Guam

Regional Director, FWPCA
Room 1802, 100 McAllister Street
San Francisco, California 94102
Area code 415: 556-5876

SOUTH CENTRAL REGION

Arkansas, Louisiana,
New Mexico, Oklahoma, Texas

Regional Director, FWPCA
1114 Commerce Street
Dallas, Texas 75202
Area code 214: 749-2161

MISSOURI BASIN REGION

Colorado, Kansas, Missouri,
Nebraska, North Dakota,
South Dakota, Wyoming

Regional Director, FWPCA
601 East Twelfth Street
Kansas City, Missouri 64106
Area code 816: 374-5493

GREAT LAKES REGION

Illinois, Iowa, Michigan,
Minnesota, Wisconsin

Regional Director, FWPCA
Room 410, 33 East Congress Parkway
Chicago, Illinois 60605
Area code 312: 353-5250

OHIO BASIN REGION

Indiana, Kentucky, Ohio,
West Virginia

Regional Director, FWPCA
4676 Columbia Parkway
Cincinnati, Ohio 45226
Area code 513: 871-1820

SOUTHEAST REGION

Alabama, Florida, Georgia,
Mississippi, Tennessee,
Puerto Rico, Virgin Islands

Regional Director, FWPCA
Room 404, 50 Seventh Street, N.E.
Atlanta, Georgia 30323
Area code 404: 526-5737

MIDDLE ATLANTIC REGION

Maryland, North Carolina,
Pennsylvania, South Carolina,
Virginia, District of Columbia

Regional Director, FWPCA
300 West Main Street
Charlottesville, Virginia 22901
Area code 703: 296-5171

NORTHEAST REGION

Connecticut, Delaware, Maine,
Massachusetts, New Hampshire,
New Jersey, New York,
Rhode Island, Vermont

Regional Director, FWPCA
14th Floor
John F. Kennedy Federal Building
Boston, Massachusetts 02203
Area code 617: 223-7212

The Federal Water Pollution Control Administration of the U.S. Department of the Interior conducts programs of research, technical assistance, enforcement, and training for water pollution control. These programs and other related water pollution control functions represent direct operations toward achieving the Administration's objective to enhance the quality and value of the nation's water resources and to prevent, control, and abate pollution.

The fiscal year water pollution control training as enumerated in this Bulletin provides for an expanded training program of the Federal Water Pollution Control Administration. Water pollution control training is offered at each of the following laboratories and facilities of the Administration: The Alaska Water Laboratory in College, Alaska; Northeast Region Project Office (Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project), Metuchen, New Jersey; the Pacific Northwest Water Laboratory in Corvallis, Oregon; the Southeast Water Laboratory in Athens, Georgia; the Robert S. Kerr Water Research Center in Ada, Oklahoma; and the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio.

As the national growth accelerates, problems associated with the control of water pollution increase in magnitude and complexity. A concomitant advance in scientific knowledge results in widespread technological changes, often of a highly sophisticated nature. Programs in this field are developing so rapidly that the demand for trained personnel exceeds their availability. Many public and private agencies are enlarging their training efforts in this area but much more must be done if the needs of water pollution control programs are to be met. The States, in developing water quality standards and encouraging preventive control, have trained manpower needs now.

The function of the Training Program is to provide the specialized technical training at all levels necessary to shorten the gap between the development of new technologies in the field of water pollution control and their application by professional and ancillary personnel working in the field. In order to fulfill this function, courses are designed and conducted by the training staff for wastewater treatment operators in both old and new plants and technical personnel in water pollution control. Scientists, engineers, and recognized authorities from government agencies, universities, and industry supplement the training staff by serving as lecturers and consultants at training courses.

The courses provide intensive training at both the operator and the graduate level. The scope and level of these courses are varied to meet the specialized needs of those receiving training. Subject areas will be directed to the water pollution aspects of sanitary engineering, chemistry, aquatic biology, and microbiology, water quality management and techniques of conducting water quality studies. They will be conducted at various locations as training needs dictate. Field courses are conducted by the respective water laboratory cooperatively with Regional Offices of the Federal Water Pollution Control Administration, State water pollution control agencies, universities and other interested groups. The training affords the opportunity of reaching large numbers of water pollution control personnel who might otherwise not be able to receive such instruction.

Contents

	Page
Information for Applicants	6
Federal Water Pollution Control Administration Laboratories	8
Chronological Schedule of Courses Offered by the Federal Water Pollution Control Administration	9
Course Descriptions	13
Federal Water Pollution Control Administration Facilities Offering Training	25
Ada, Oklahoma	27
Athens, Georgia	31
Cincinnati, Ohio	35
College, Alaska	39
Corvallis, Oregon	43
Metuchen, New Jersey	47
Applications for Training	51

Information for Applicants

Training Objectives

The Program provides training in technical matters relating to the causes, prevention, and control of water pollution to personnel of public agencies and other persons with suitable qualifications. Courses are given for scientists, engineers, and other professional people in the field of water pollution control. Further, specially designed operator training courses are offered to both the professional and nonprofessional personnel engaged in wastewater treatment plant operation. The training provides effective means of consideration and appraisal of the newest developments in the subject areas, with opportunity for practice in the application of the latest techniques. Training is given in lectures supplemented by visual aids and closed-circuit television, demonstrations, problem sessions, and panel discussions. Laboratory and field practice, where applicable, give opportunity to acquire proficiency in the new techniques under the guidance of experts. Full trainee participation is encouraged and, in fact, is scheduled as an important part of each course.

Training Faculty

The courses are planned, developed, and conducted by the Training Program's full-time staff of specialists. Water Laboratory technical assistance and research personnel and guests from other government agencies, universities, and industries, participating as lecturers and consultants, contribute significantly with their specific knowledge and experience.

Technical Courses

Highly specialized, technical courses of one to two weeks' duration are conducted in the fully equipped classrooms and laboratories of the Training Program. The training listed in this Bulletin is offered at the following Federal Water Pollution Control Administration laboratories and field project office:

Robert S. Kerr Water Research Center
P. O. Box 1198, Ada, Oklahoma 74820

Southeast Water Laboratory
College Station Road, Athens, Georgia 30601

Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway, Cincinnati, Ohio 45226

Pacific Northwest Water Laboratory
200 South 35th Street, Corvallis, Oregon 97330

Northeast Region Project Office
Metuchen, New Jersey 08840

In addition, during Fiscal Year 1968 a limited number of water pollution control training courses may be arranged for presentation at the Alaska Water Laboratory, College, Alaska, by contacting the Training Officer at the Laboratory.

Technical courses provide intensive training in basic knowledge, methodology and laboratory practice. Content is usually at the postgraduate level, except where indicated for specific courses.

A few broad-coverage courses are offered for those in technical, administrative positions who wish to acquire an over-all perspective in specific areas. Courses are described in the Bulletin under subject categories with dates and locations specified. The Chronological Schedule lists all the courses by dates. Agenda of all courses are available on request in advance of course presentation. Advance information on the courses is provided to all the registrants.

Operator Training

In carrying out the Training Program responsibilities, courses are offered to wastewater treatment plant operators and state personnel engaged in operator training activities. Practicable means are demonstrated of treating municipal sewage and other waterborne wastes to remove the greatest possible amounts of physical, chemical, and biological pollutants in order to restore and maintain the maximum amount of the Nation's water at a quality suitable for reuse. Improved methods and procedures to identify and measure the effects of pollutants on water uses are presented. The courses offer training to operator personnel seeking information on the effects of wastewaters upon water quality; basic factors of operational control and maintenance; essentials of testing plant performance and reporting results; and the operator's function in maintaining water quality standards.

Orientation Courses

At the request of State or local officials engaged in water pollution control activities, universities, or other appropriate agencies, the Training Program plans and conducts, within staff and time limitations, orientation courses of one or two days to one week. Enrollment requirements and trainee roster are determined usually by the requesting agency. Course agenda and other detailed information may be prepared on request. Negotiations for planning and scheduling an orientation course should be initiated well in advance of the date of presentation. Information on negotiation procedures is available from the appropriate FWPCA Regional Director, the Regional Water Laboratory, or from the Chief of the Training Program. Regional Office locations are shown on page 3.

Technical Seminars

The Training Program assists and participates from time to time in the presentation and conduct of technical seminars in the program fields. These meetings bring together large groups of experts, often world-wide, for the exchange of important information. They are not announced in the Bulletin but through scientific journals and by special announcement or personal invitation from the Director of the FWPCA Water Laboratory and may be held at any one of the FWPCA facilities.

Admission to Courses

Admission to courses is by application on forms provided at the back of the Bulletin. Additional forms may be obtained from any Federal Water Pollution Control Regional Office (page 3), or Water Laboratory (page 8), or from:

Chief, Training Program
Department of the Interior, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati, Ohio 45226
Area code 513: 871-1820 Extension 212

NO TUITION OR REGISTRATION FEE IS CHARGED. Early application is advised, since course rosters are limited and acceptance is governed by priority of application. Trainees are expected to provide for their own housing and transportation while attending courses. To provide training service to a maximum number of organizations, the number of applicants from a single agency for any one course necessarily may be limited. To apply for admission to a course, fill out an application form at the back of the Bulletin, preferably a separate form for each course. Mail to the Laboratory offering the training.

LABORATORIES OF THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION OFFERING TRAINING

Robert S. Kerr Water Research Center
P. O. Box 1198
Ada, Oklahoma 74820

Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati, Ohio 45226

Alaska Water Laboratory
College, Alaska 99701

Pacific Northwest Water Laboratory
200 South 35th Street
Corvallis, Oregon 97330

Northeast Region Project Office
Federal Water Pollution Control Administration
Metuchen, New Jersey 08840

A Chronological Schedule of Courses

Chronological Schedule of Courses

FISCAL YEAR 1968

The following schedule is a complete roster of short-term technical courses, including wastewater treatment plant operator training, offered by Water Pollution Control Training at five laboratories of the Federal Water Pollution Control Administration, Department of the Interior. The courses are listed chronologically, followed by course title and number, location, and page where a description of the course can be found. A limited number of Water Pollution Control Training courses may be arranged for presentation in Alaska through the Alaska Water Laboratory, College, Alaska, by contacting the Chief of Training at the Laboratory.

1967 Page

July 10-14, 1967
Plankton Analysis for Treatment Plant Operators (142)
Cincinnati, Ohio. 18

July 24 - August 4, 1967
Water Quality Studies (161)
Cincinnati, Ohio. 21

August 14-25, 1967
Chemical Analyses for Water Quality (100)
Cincinnati, Ohio. 14

August 28 - September 1, 1967
* Statistical Method-Evaluation and Quality Control for the Laboratory (851)
Cincinnati, Ohio. 24

September 11-15, 1967
Membrane Filter Methods for Treatment Plant Operators (121)
Corvallis, Oregon 17

September 11-22, 1967
Water Quality Studies (161)
Metuchen, New Jersey 21

September 18-29, 1967
Chemical Analyses for Water Quality (100)
Ada, Oklahoma 14

September 27-29, 1967
Seminar on the FWPCA: Structure and Functions (174) Cincinnati, Ohio. 23

October 9-20, 1967
Water Quality Studies (161)
Corvallis, Oregon 21

October 9-20, 1967
Freshwater Biology and Pollution Ecology (140) Cincinnati, Ohio. 17

October 16-20, 1967
Freshwater Pollution Ecology (143)
Cincinnati, Ohio. 19

October 23 - November 3, 1967
Laboratory Analyses for Treatment Plant Operators (105)
Cincinnati, Ohio. 15

November 6-8, 1967
Applications of Biological Principles in Water Pollution Control (146)
Ada, Oklahoma 20

Page

November 6-17, 1967
Chemical Analyses for Water Quality (100)
Metuchen, New Jersey 14

November 6-17, 1967
Laboratory Analyses for Treatment Plant Operators (105)
Corvallis, Oregon 15

November 27 - December 8, 1967
Water Quality Studies (161)
Ada, Oklahoma 21

December 4-15, 1967
Physical-Chemical Treatment of Wastewaters and Sludges (172)
Cincinnati, Ohio. 23

1968

January 8-19, 1968
Current Practices in Water Microbiology (120) Cincinnati, Ohio 16

January 8-19, 1968
Chemical Analyses for Water Quality (100)
Corvallis, Oregon 14

January 22-24, 1968
Applications of Biological Principles in Water Pollution Control (146)
Cincinnati, Ohio. 20

January 22-26, 1968
Geohydrologic Relationships in Water Pollution (168) Ada, Oklahoma. 22

January 22 - February 2, 1968
Analysis of Pesticides in the Aquatic Environment (103)
Athens, Georgia. 14

January 29 - February 2, 1968
Orientation to Automated Instrumentation in Water Pollution Surveillance (106)
Cincinnati, Ohio. 15

January 29 - February 2, 1968
Pollution Problems Related to Groundwater (169)
Ada, Oklahoma 22

Page

February 5-16, 1968
Biological Treatment of Wastewaters and Sludges (162)
Cincinnati, Ohio. 21

February 5-16, 1968
Current Practices in Water Microbiology (120)
Metuchen, New Jersey 16

February 26 - March 1, 1968
Freshwater Pollution Ecology (143)
Cincinnati, Ohio. 19

February 26 - March 1, 1968
Data Analysis and Evaluation in Water Pollution Studies (171)
Ada, Oklahoma 22

March 4-15, 1968
Freshwater Biology and Pollution Ecology (140) Corvallis, Oregon 17

March 4-15, 1968
Analysis of Pesticides in the Aquatic Environment (103)
Cincinnati, Ohio. 14

March 18-22, 1968
Membrane Filter Methods for Treatment Plant Operators (121)
Cincinnati, Ohio. 17

March 18-22, 1968
*Statistical Method-Evaluation and Quality Control for the Laboratory (851)
Cincinnati, Ohio. 24

March 25-29, 1968
STORET *System for Data Handling in Water Pollution Control (167)
Cincinnati, Ohio. 21

March 25 - April 5, 1968
Freshwater Biology and Pollution Ecology (140) Ada, Oklahoma 17

April 1-5, 1968
Freshwater Pollution Ecology (143)
Ada, Oklahoma 19

April 1-12, 1968
Laboratory Analyses for Treatment Plant Operators (105)
Cincinnati, Ohio. 15

April 8-12, 1968
Data Analysis and Evaluation in Water Pollution Studies (171)
Athens, Georgia. 22

April 22 - May 3, 1968
Chemical Analyses for Water Quality (100)
Cincinnati, Ohio. 14

Page

April 29 - May 10, 1968
*Marine Biology and Pollution Ecology (144) Athens, Georgia 19

May 6-10, 1968
*Marine Pollution Ecology (145)
Athens, Georgia. 20

May 6-17, 1968
* Marine Biology and Pollution Ecology (144) Corvallis, Oregon 19

May 6-17, 1968
Current Practices in Water Microbiology (120) Ada, Oklahoma 16

May 13-15, 1968
Applications of Biological Principles in Water Pollution Control (146)
Athens, Georgia. 20

May 13-17, 1968
* Marine Pollution Ecology (145)
Corvallis, Oregon 20

June 3-14, 1968
Plankton Analysis (141)
Cincinnati, Ohio. 18

June 17-28, 1968
Water Quality Studies (161)
Athens, Georgia. 21

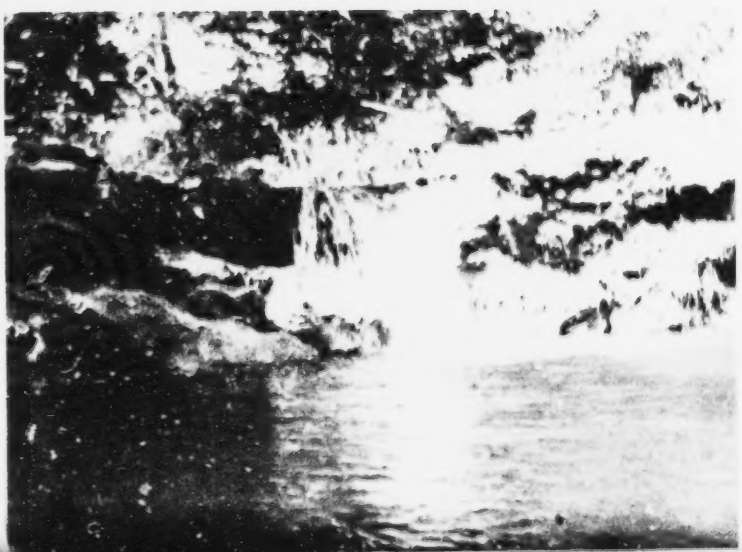
Date to be announced
Operation of Automated Instrumentation in Water Pollution Surveillance (107)
Cincinnati, Ohio. 16

Date to be announced
Basic Principles of Wastewater Treatment Operation (173)
Cincinnati, Ohio. 23

Through Special Arrangement with the Water Laboratory
*Seminar on Water Pollution Control Problems (199)
Metuchen, New Jersey; Cincinnati, Ohio, Athens, Georgia. 24

*At a field location to be announced later by the Water Laboratory.

During Fiscal Year 1968, a limited number of Water Pollution Control Training Courses may be arranged for presentation in Alaska through the Alaska Water Laboratory, College, Alaska by contacting the Chief of Training at the Laboratory.



Course Descriptions

CHEMICAL ANALYSES FOR WATER QUALITY (100)

2 weeks

ADA, OKLAHOMA	**September 18-29, 1967**
CINCINNATI, OHIO	**August 14-25, 1967**
	April 22-May 3, 1968
CORVALLIS, OREGON	**January 8-19, 1968**
METUCHEN, NEW JERSEY	**November 6-17, 1967**

This course is designed for chemists, biologists and engineers having a professional background and responsibility in performing, using or interpreting chemical analyses for water quality. Various methods are stressed that are useful to increase specificity and validity of chemical criteria related to water pollution control, and compliance with water quality standards for the acceptability of water for all beneficial uses.

Major objectives are:

- To promote an understanding of selected tests employed in chemical analysis
- To outline advantages and limitations of specific test methods or instrumentation
- To improve capabilities for selection of effective analytical methods
- To practice application of selected wet chemical and instrumental methods, and
- To evaluate results in terms of statistical inferences.

Selected analytical procedures are presented in lecture-discussion sessions in the classroom outlining essentials of the test, control technique and interpretation. About half of the course time is devoted to trainee practice in laboratory operations. The trainees utilize wet chemical procedures and instrumentation for visible, infrared, flame and atomic absorption spectroscopy, polarography, dissolved oxygen, pH and conductivity meters. Calculation of results are performed in homework or workshop sessions and the results compared statistically in class discussions.

The trainees have an opportunity for conferences on special problems with specialists who may be available during the course. Those enrolled in the course have an opportunity to broaden their contacts in the field, to acquire new sources of information and to enhance their capabilities for getting meaningful results that are related to the particular situation.

ANALYSIS OF PESTICIDES IN THE AQUATIC ENVIRONMENT (103)

2 weeks

ATHENS, GEORGIA	**January 22-February 2, 1968**
CINCINNATI, OHIO	**March 4-15, 1968**

The course is designed for chemists and technical specialists (individuals carrying out highly sophisticated chemical analyses) desiring to learn how to select and perform procedures for the collection, identification and measurement of persistent pesticides in the aquatic environment. The trainee who will benefit most from this course is one who has had previous experience in identification and measurement of chemical pollutants in the aquatic environment.

In recent years, public concern has arisen over the existing and potential damage to our natural water resources by pesticide pollution. The widespread use of pesticides and the resultant water pollution problems have produced a need for local, state, and Federal water pollution control agencies to conduct surveillance programs in determining compliance with water quality standards.

The analytical procedures taught in the course will conform to those currently in use by the Federal Water Pollution Control Administration in its official investigations. In addition, attention will be given to implications of the latest research.

Lecture topics will include:

- Distribution and behavior of pesticides in the aquatic environment
- Collection and preservation of water, sediment and biological samples
- Extraction methods
- Column and thin-layer chromatography
- Electron capture gas chromatography
- Microcoulometric gas chromatography
- Infra-red spectroscopy
- Enzymatic methods
- Comparative methodology and quality control

Laboratory practice will include the following analyses:

- Chlorinated hydrocarbon insecticides and phenylalkanoic acid herbicides in raw water
- Organophosphorus and chlorinated hydrocarbon insecticides in sediment
- Chlorinated hydrocarbon insecticides in fish

ORIENTATION TO AUTOMATED INSTRUMENTATION IN WATER POLLUTION SURVEILLANCE (106)

1 week

CINCINNATI, OHIO **January 29-February 2, 1968**

The course is designed for technically oriented management personnel having administrative responsibilities for program development and execution in water quality surveillance and water pollution control.

Directors of state water pollution surveillance and control programs and their senior staff members, and Directors of Federal Water Pollution Control Administration comprehensive projects and their senior staff members, will receive timely and valuable information regarding the current status and applicability of automated, multitest instrumentation for use in water pollution surveillance systems in field monitoring for compliance with water quality standards.

Personnel who have responsibilities for operation, maintenance and other phases of utilization of existing systems for automated instrumental determination of water quality are advised to consider enrollment in the two-week course "Operation of Automated Instrumentation in Water Pollution Surveillance" (107) now under development.

The Water Quality Act of 1965, and the Clean Waters Restoration Act of 1966, have created an enormous stimulus to the program of water pollution control by inviting the states to establish their own Water Quality Standards and systems for their compliance, subject to Federal approval. The need for providing mechanisms for ensuring compliance with Standards will, in many cases, require installation of automated facilities for the detection of pollution in surface waters on a continuous or round-the-clock basis.

The purpose of this one-week orientation course is to summarize the present "state of the art" of automated, multitest water quality surveillance instrumentation and its applicability to continuous or long-term surveillance programs. It is expected that the administrator who enrolls in this course will gain information beneficial to him in decision-making with regard to the technical and economic feasibility of such installations in his own water pollution control program.

The course includes a consideration and indentification of environmental situations requiring continuous monitoring for water pollution within the framework of a brief, but comprehensive, survey of the usual criteria of water quality. The characteristics of waters subject to analysis by means of automated, multitest instrumentation is identified. The currently available instrumentation is reviewed, with opportunity for critical evaluation of the relative merits of each system. Operational demonstrations of typical examples are included. The presentations incorporate discussions of the development and use of instrument specifications, economic aspects of utilization of automated surveillance instrumentation, and a basis for storage, retrieval and interpretation of data. Experiences of Federal, state, and interstate agencies demonstrating a need for automated monitoring systems are included as case examples.

LABORATORY ANALYSES FOR TREATMENT PLANT OPERATORS (105)

2 weeks

CINCINNATI, OHIO **October 23-November 3, 1967**
April 1-12, 1968

CORVALLIS, OREGON **November 6-17, 1967**

This course is offered for personnel having responsibilities for performing tests required for wastewater treatment control. Coliforms, BOD, solids, and plant-loading are presented among the required test criteria; bioassay, nitrogen, and phosphorus determinations are among those presented for special interest or clarification purposes in relation to its effect upon water quality.

The primary objective is to increase trainee capabilities in practical test procedures for improved treatment plant operation and overall water quality enhancement. Information on what the test measures, why it is used, what factors confuse results, and how these interferences can be controlled or decreased, is used to promote the possibilities for meaningful results.

The course will include lectures and class discussions on general laboratory procedures, function of the laboratory, record-keeping and procedures for specific determinations. Demonstrations and laboratory practice will be used to promote specific skills and technique. The calculation of results and their conversion to plant or stream conditions are planned on a worksheet basis. A multidisciplinary approach will be used to promote communication among the analyst, his associates, his supervisors, and the public.

Completion of this course is not intended as a qualification for the specific requirements of any State Certification Program; it is intended to increase analytical proficiency and understanding as part of a continuing development of individual capability and improving both plant efficiency and performance.

OPERATION OF AUTOMATED INSTRUMENTATION IN WATER POLLUTION SURVEILLANCE (107)

1 week

CINCINNATI, OHIO — **Date to be announced**

The course is designed for technical personnel having operational responsibilities in utilization of automated multitest instrumentation in programs of water pollution surveillance associated with water quality standards. Pollution control workers whose concern with automated instrumentation is limited to management and decision-making matters of policy regarding installation and effective use of automated instrumentation are advised to enroll in the course "Orientation to Automated Instrumentation in Water Pollution Surveillance" (106), described elsewhere in this Bulletin.

The purpose of the course is to train the technical worker in the applications, principles of operation, merits and limitations, and detailed operational procedures of representative examples of currently available automated, multitest water pollution surveillance instrumentation. Many elements of the "Orientation to Automated Instrumentation in Water Pollution Surveillance" (106) course are included in this presentation.

Included are reviews of:

- The range of tests and measurements involved in overall evaluation of water quality
- The qualities of water subject to instrumental measurement
- Currently available multitest automated instrumentation, and
- A number of other pertinent areas of background information

Detailed attention is given to currently available and representative instrumentation, with special reference to operational details, field servicing techniques, checks for operational efficiency, and first-line trouble-shooting, repair, and maintenance. Installation of automated instrumentation systems is stressed, with special reference to effective site selection and the problems relating to sample intake equipment and the influence of such equipment on the validity of results as associated with water quality standards. Approximately half of the course is devoted to laboratory and field studies.

For further orientation to the function of automated instrumentation, the course participant is introduced to the operations of data accumulation, storage, readout, interpretation, and to the utilization of such data in the management of water quality for pollution abatement and overall water quality enhancement.

CURRENT PRACTICES IN WATER MICROBIOLOGY (120)

2 weeks

ADA, OKLAHOMA	**May 6-17, 1968**
CINCINNATI, OHIO	**January 8-19, 1968**
METUCHEN, NEW JERSEY	**February 5-16, 1968**

The course is designed for professional bacteriologists and other laboratory personnel engaged in the bacterial analysis of water in Federal, state or local laboratories. The basic purpose of the course is to provide the participant with up-to-date background information thus enabling him to acquire knowledge and skill to determine the bacterial quality of water in accordance with the highest standards of current recommended methodology.

To achieve this broad objective, emphasis is given both to the traditional and to the recent and current results of investigations of bacterial indicators of pollution including coliforms, fecal coliforms and fecal streptococci. The characteristics, environmental occurrence, significance and methods of detection and enumeration of these bacterial groups are studied in detail. In addition, attention is given to the detection of enteric pathogenic bacteria in polluted waters, as an adjunct to determination of indicator groups, and to the increasing utilization of such findings in investigations of water pollution.

Classroom presentations and extensive laboratory application give the participant opportunity to develop ability in use of the most suitable laboratory methods and in the interpretation of laboratory data. Both Standard Methods and promising new methods are included. Multiple dilution tube methods and membrane filter methods are featured in the laboratory studies.

The scope of the course is broadened through classroom presentations on pertinent related topics, such as the role of the bacteriologist in planning, conducting and interpreting results of water pollution surveys; critical factors in collection and handling of samples for bacterial tests; occurrence and significance of other microscopic biota, including viruses, minute or microscopic invertebrate animals, algae, fungi, and filamentous nuisance bacteria. Special laboratory studies include tests for further identification of pure cultures of fecal streptococci, testing the quality of distilled water supplies for use in the bacteriology laboratory, and direct microscopic examination of samples for identification of filamentous nuisance bacteria. In special cases, optional additional laboratory study may be made available in such procedures as the evaluation of germicidal efficiency in disinfection of water, cultivation of actinomyces or other proce-

dures of special concern in the area in which the course is given.

Opportunity is provided for individual conferences with research personnel and other specialists on technical problems not specifically dealt with in this course.

MEMBRANE FILTER METHODS FOR TREATMENT PLANT OPERATORS (121)

1 week

CINCINNATI, OHIO	**March 18-22, 1968**
CORVALLIS, OREGON	**September 11-15, 1967**

The course is intended to meet the needs of treatment plant operators using membrane filters for the bacterial analysis of waters and wastewaters. Applicants also are admitted from Federal, state or local water pollution control agencies and health departments, university faculties and private industry. Non-laboratory personnel may be accepted for training, but should understand that the course subject matter and laboratory instruction are oriented to the needs of the laboratory worker.

Approximately half of the instruction is devoted to classroom presentations; all other scheduled activity is directed to a carefully planned and graded series of laboratory studies placing increasing demands on the exercise of individual skill and judgment in the effective use of membrane filter methods. Students completing this course are able to apply the necessary techniques in use of membrane filters in water bacteriology. They can select, prepare and maintain laboratory supplies, equipment and culture media; they perform sample filtrations, incubation and examination of membrane filter cultures, including the computation and reporting of results. They can review their own laboratory practices and results critically for maintenance of the highest standards of performance. To provide assistance in meeting a provisional approval of membrane filter methods in the current (12th) edition of "Standard Methods for the Examination of Water and Wastewater" a protocol for comparative testing between membrane filter methods versus the multiple tube method is included in the course.

In addition, students are acquainted with several types of special membrane filter equipment suitable for use in field or emergency conditions. While the course normally is directed toward development of proficiency with equipment intended for use in the laboratory, special arrangements can be made whereby individuals can take the course with the entire laboratory program directed to use of field equipment.

FRESHWATER BIOLOGY AND POLLUTION ECOLOGY (140)

2 weeks

ADA, OKLAHOMA	**March 25-April 5, 1968**
CINCINNATI, OHIO	**October 9-20, 1967**
CORVALLIS, OREGON	**March 4-15, 1968**

This course is designed for sanitary engineers, scientists and non-biologists engaged in water pollution analysis and control activities. However, biologists new to the field of pollution control may find it useful for orientation. The first week is devoted to the observation and identification of aquatic organisms; the second, to their pollutional interpretation.

The trainee learns to apply the fundamentals of biology to the analysis of water pollution and water supply problems. Laboratory practice enables him to tentatively identify aquatic organisms and to interpret their significance. Tainting of fish flesh by sublethal quantities of industrial wastes is demonstrated when practicable. The trainees learn to evaluate toxic wastes by means of Standard Methods bioassays employing fish. Biological problems of lakes, reservoirs, streams and estuaries are considered, with emphasis on the ecology of streams. In field practice and observations, trainees acquire familiarity with biological collecting equipment and its use in water pollution control investigations and studies. Appropriate field work is conducted.

It is the general objective of this course to enable non-biologists to become familiar with certain fundamental biological parameters and to make use of them in the analysis of water quality.

Course topics include:

- Biological aspects of water quality management; engineering and biological relationships in the aquatic environment
- Aquatic organisms significant in water quality enhancement programs
- Biology of stream sanitation
- Biological effects and evaluation of industrial wastes
- Effects of pesticides on aquatic life
- Use of bioassay in industry
- Assay of fish-flesh tainting by sublethal quantities of industrial wastes
- Biological problems of lakes and reservoirs
- Biological aspects of marine and estuarine pollution
- Biological significance of radioactive wastes
- Water quality criteria for aquatic life

Applicants having a basic knowledge of aquatic biology may prefer to attend the second week only; in this case, they should register for "Freshwater Pollution Ecology" (143).

PLANKTON ANALYSIS (141)

2 weeks

CINCINNATI, OHIO **June 3-14, 1968**

This course is offered for professional personnel concerned with the ecology of natural and polluted waters and with water resources evaluation for beneficial water uses.

Instruction enables the trainee to carry out basic laboratory procedures in the identification and counting of both phytoplankton and zooplankton. Forms frequently found in water and wastewater treatment plants and polluted environments are emphasized. Class members carry counting and enumeration to the point where all obtain essentially the same result on a given sample.

Attention is given to the significance of various types of plankton counts. Techniques for plankton control are presented. Time is provided for discussion of local problems, both in class and with specialists at the training facility.

Course topics include:

- Water quality problems of biological origin
- Identification of planktonic animals and plants
- Microscope calibration
- Plankton analysis
  - Sampling and preparation
  - Techniques of counting
  - Enumeration, methods selection
- Plant operation problems
  - Waste treatment
  - Plankton in stabilization ponds
  - Toxic algae
  - Other treatment problems
- Plankton control
  - Plant control
  - Impoundment control

A limited number of microscopes are available for class use. Since effective training results when extended and applied in the home laboratory, trainees are urged to bring their own microscope to the course. They should be hand-carried, not shipped, if possible. In this way, trainees can be instructed in obtaining optimum results with the same instrument they will be using in their home laboratory. The microscope should have magnifications to approximately 400X; oil immersion is optional.

Introductory treatment of this subject is offered in "Plankton Analysis for Treatment Plant Operators," Course No. 142.

Further information will be provided on request.

PLANKTON ANALYSIS FOR TREATMENT PLANT OPERATORS (142)

1 week

CINCINNATI, OHIO **July 10-14, 1967**

This course is offered for the orientation of wastewater or water supply treatment plant operating personnel and others concerned with basic problems pertaining to the microscopic examination of water. Since the procedures and types of organisms encountered are essentially the same, regardless of whether one is concerned with a stabilization pond, a potable water supply, or even an activated sludge tank, each group requires the same basic instruction.

Instruction enables the trainee to recognize and frequently to control the various types of pollution problems caused by troublesome microorganisms, e.g., algae and other organisms which may create tastes and odors, clog filters, or form troublesome blankets over reservoirs or holding basins and in streams. The trainee gains increased competence to interpret the significance of the various types and numbers of microorganisms and is able to organize an appropriate sampling program. Opportunity is provided also for discussion of local situations and problems.

The following topics pertaining to the nature of water treatment biology are included in the course agenda:

- Identification of types of microorganisms (an extensive series of laboratories and lectures)
- Techniques of field sampling programs
- Techniques of laboratory preparations for observation
- Calibration of equipment
- Quantitative and qualitative counting
- Principles of field and in-plant control of microorganisms associated with water treatment

A more advanced treatment of this field is offered in course 141, "Plankton Analysis."

Microscopes are available for class use, though trainees are urged to bring their own microscope to the course. They should be hand-carried, not shipped, if possible. In this way, trainees can be instructed in obtaining optimum results with the same instrument they will be using in their home laboratory. It should have magnifications of approximately 400X; oil immersion is optional. Further information will be provided on request.

FRESHWATER POLLUTION ECOLOGY (143)

1 week

CINCINNATI, OHIO	**October 16-20, 1967** **February 26-March 1, 1968**
ADA, OKLAHOMA	**April 1-5, 1968**

This course is offered for biologists, conservation officers, water pollution control officers, industrial specialists and others concerned with the techniques of biological evaluation of polluted waters. If the applicant is not already familiar with aquatic life, he is advised to take "Freshwater Biology and Pollution Ecology" (140).

On completion of this course, the trainee will have requisite technical information to assess a water pollution situation and determine biological parameters necessary for investigation. Depending on his field of specialization, he might personally conduct one or another series of field observations, but he should be able to evaluate and interpret all types of observations. The trainee will be able to plan, conduct, and interpret bioassays of industrial wastes or other substances in any water. This training will enable him to prepare a meaningful report of the biological observations, properly integrated with other types of observations.

This course is designed to enable biologically oriented persons to apply sound procedures for the impartial evaluation of the effects of pollution. It provides sufficient information relative to environmental relationships to enable the trainee to select the technique most appropriate.

Applicants will be involved in a number of interesting and stimulating field assignments.

Agenda topics will include:

- Effects of toxic industrial wastes on aquatic life
- The toxicity bioassay employing fish
- Use of bioassay in industry
- Oxygen requirements of aquatic organisms
- Sources and types of industrial wastes
- Significance and interpretation of various types of aquatic life
- The tainting of fish flesh by sublethal quantities of industrial wastes
- Marine and estuarine pollution
- Effects of pesticides on the aquatic environment
- Biological aspects of radioactive wastes
- Biological problems of lakes and reservoirs
- An assessment of pollution damage to aquatic biota
- Water quality criteria for aquatic life

MARINE BIOLOGY AND POLLUTION ECOLOGY (144)

2 weeks

ATHENS, GEORGIA*	**April 29-May 10, 1968**
CORVALLIS, OREGON*	**May 6-17, 1968**

This 2-week course is designed for sanitary engineers, and other scientists involved in coastal and estuarine pollution control. Basically it is designed to train nonbiologists in the fundamentals of using biological principles in the solution of marine pollution problems in coastal areas. Training is intended for technically oriented persons who need practical experience in recognizing and evaluating biological phenomena.

Participants will be taught to make certain elementary biological analyses of pollution in estuarine and coastal areas (as distinguished from fresh-water or oceanic situations). Biologists new to the fields of pollution control and marine biology may also find this course useful for orientation.

The first week of the course will be devoted to a survey of various marine organisms with emphasis on those forms with a known pollutional response. This portion of the course, or equivalent experience, is prerequisite to the second week, which will deal with the ecology of pollution. Applicants having a basic knowledge of marine biology may prefer to attend the second week only; in this case they should register for "Marine Pollution Ecology" (145).

Trainees should provide themselves with clothes appropriate for field work, such as wading on mud flats and boat trips.

Course topics include:

- Identification of common and significant marine organisms
- The laws and principles governing distribution and survival of aquatic organisms
- Proper field-collecting and sampling techniques
- Recognition of biological phenomena and related pollution significance
- Operation and use of Standard Method bioassay test of toxic waste
- Conduct of a biological survey
- Basic vocabulary of practical biological terms
- Effective presentation of biological data

*Laboratory responsible for conducting course. Marine laboratory location to be announced. Communicate with Laboratory for further information.

MARINE POLLUTION ECOLOGY (145)

1 week

ATHENS, GEORGIA*	**May 6-10, 1968**
CORVALLIS, OREGON*	**May 13-17, 1968**

This course is designed for biologists and those who have had biological training or experience and are concerned with coastal and estuarine water pollution control. Equivalent experience or the first week of "Marine Biology and Pollution Ecology" (144) is prerequisite.

On completion of this course, the trainee should be able to:

- Assess a water pollution situation and recognize critical ecological parameters in a marine environment
- Evaluate field observations and relate them to pollution
- Prepare, conduct and analyze bioassays of industrial wastes
- Understand the need for proper design in order to conduct an adequate field sampling program and associated laboratory analyses
- Present biological data, properly integrated with other types of observations

The course is designed to enable biologically oriented persons to determine correct procedures for the impartial evaluation of the effects of pollution. It provides sufficient information concerning environmental relationships to enable the trainee to recognize the technique most appropriate to the circumstances. Appropriate field studies are conducted.

Course topics include:

- Marine waste disposal
- The toxicity of wastes to marine organisms
- Bioassay methodology
- The effects of pollution on various marine communities
- The ecological relationships of pollution in estuaries and coastal areas
- Sampling techniques
- Survey objectives and sampling design
- Statistics as an ecological tool
- Analysis, interpretation and presentation of biological data

*Laboratory responsible for conducting course. Marine laboratory location to be announced. Communicate with Laboratory for further information.

APPLICATIONS OF BIOLOGICAL PRINCIPLES IN WATER POLLUTION CONTROL (146)

3 days

ADA, OKLAHOMA	**November 6-8, 1967**
ATHENS, GEORGIA	**May 13-15, 1968**
CINCINNATI, OHIO	**January 22-24, 1968**

Other locations by arrangement

This course is intended for persons concerned with planning, administering, collecting, evaluating, interpreting and reporting biological data related to water quality studies in both fresh and marine waters. The trainees may not necessarily be biologically oriented.

The main objective of this course is to promote more effective utilization of this technical discipline which is fundamental in water pollution control. This will be accomplished by imparting a more complete appreciation of the advantages and potential contributions of biological data and investigations to administrators, project leaders and others. Biologists will gain a better understanding of the limitations and restrictions placed on the administrator, and the nature of biological data which will be most useful for the improvement of water quality.

The following topics will be included:

- Orientation in the nature of the aquatic environment and aquatic ecology
- The nature of biological parameters
- "Pollution" under various circumstances
- Orientations in the nature of various biological procedures and habitats such as taxonomy, benthos, periphyton, plankton, nekton, bioassays, and bacteriological investigations, followed by searching discussion of the potential of each in water quality enhancement
- Techniques for the evaluation and interpretation of biological data
- The position of the administrator and his need for biological data
- The multilateral problems of communication
- The use of biological data in the establishment and administration of water quality standards and criteria.

Individuals interested in broad multidiscipline surveys should investigate Course No. 161, "Water Quality Studies."

Much of the course will consist of short formal presentations followed by extended informal discussions in the manner of a seminar. No laboratory sessions are scheduled.

WATER QUALITY STUDIES (161)

2 weeks

ADA, OKLAHOMA	**November 27-December 8, 1967**
ATHENS, GEORGIA	**June 17-28, 1968**
CINCINNATI, OHIO	**July 24-August 4, 1967**
CORVALLIS, OREGON	**October 9-20, 1967**
METUCHEN, NEW JERSEY	**September 11-22, 1967**

The course is offered for engineers, chemists, aquatic biologists, microbiologists and other professional specialists having administrative and operational responsibilities in planning and conducting water pollution surveys for water quality enhancement basin or regional programs. The course is designed to be of greatest benefit to new professional workers in the field and to more experienced workers whose normal duties in water quality surveys are inherently too specialized to provide an overall view of the factors entering into the determination of water quality.

Trainees participate in classroom presentations, demonstrations and panel discussions. Field trips are conducted to local sites which are representative of the region in which the course is given. During the field trips, trainees engage in observations and tests widely used by chemists, aquatic biologists and engineers in on-site studies. They collect samples for subsequent laboratory study and perform selected representative studies in the biology, microbiology and chemistry laboratories.

The course demonstrates the interrelationships and interdependency of the technical contributions of engineers, biologists, chemists and microbiologists in arriving at a comprehensive evaluation of water quality.

Major subject areas of the course include:

- Sources and causes of deterioration of environmental water quality
- Tests and measurements used in evaluation of water quality by biologists, chemists and microbiologists. This aspect of the course includes consideration of new technical developments in instrumentation and laboratory methodology
- Fundamental factors in planning, conducting, interpreting findings and reporting results of a water pollution survey
- Special categories of water quality studies, including ground water quality studies, tidal water studies, water pollution surveillance networks, and
- Goals for water quality from the viewpoint of municipal and industrial water supplies, fish and wildlife management, agricultural usage and recreational use of waters.

BIOLOGICAL TREATMENT OF WASTEWATERS AND SLUDGES (162)

2 weeks

CINCINNATI, OHIO **February 5-16, 1968**

This course is offered for engineers, chemists, scientists, and other professional personnel concerned with selection, design and control of biological processes for wastewater and sludge treatment.

Both aerobic and anaerobic processes are considered. Trainees attend lectures and demonstrations, solve problems, and perform detailed laboratory experiments which emphasize process principles and economics. Since approximately 40 percent of class time is spent in the laboratory, a working knowledge of sanitary engineering chemistry is desirable. Interpretation of laboratory results and problem solutions are emphasized.

This is a new course especially developed to stress practical application of biological principles in wastewater treatment technology. Basic biological and biochemical theory is not covered. Much of the material in this course has been extracted from a previous course entitled "Bio-Oxidation of Industrial Wastes."

The course emphasizes biological treatment of industrial rather than domestic, wastes. Many of the laboratory experiments are performed using actual or synthetic industrial wastes. Most of the concepts and principles discussed are equally valid and applicable for domestic waste treatment.

Major subject areas of the course include organic and hydraulic loading, respiration rates, biosorption, solids production, relationship between chemical structure and treatability, process selection (considering several of the common activated sludge, trickling filtration and sludge digestion processes), wastewater treatment microorganisms, and treatment plant operation.

STORET* SYSTEM FOR DATA HANDLING IN WATER POLLUTION CONTROL (167)

1 week

CINCINNATI, OHIO **March 25-29, 1968**

This course is intended for persons directly involved in data processing activities in the conduct of water quality studies, and in preparing and summarizing water resources information.

The course is designed to provide a detailed, working knowledge of the STORET system for storing, modifying, retrieving and analyzing water quality data and other related information.

Instruction will be provided in the general area of computer technology and the specific areas of stream and lake coding, data storage, and data analysis using the STORET system. Course problems for each trainee will provide experience with the STORET system in actual situations of station location coding, data storage and updating, and data retrieval techniques. The course will demonstrate the system's flexibility for:

Data modification
Production of qualitative and quantitative statistical summaries
Development of municipal water and wastewater inventories, and
Development of industrial wastewater inventories.

The utilization of the terminal concept in the STORET system will be explained.

Persons attending should have a technical background and experience in water quality and resources work but need not have experience in computer programming. Persons with computer programming experience will find areas for further utilization of the STORET system relating to specialized problems.

*STORET - A "coined" word combining STOrage and RETrieval.

GEOHYDROLOGIC RELATIONSHIPS IN WATER POLLUTION (168)

1 week

ADA, OKLAHOMA **January 22-26, 1968**

This course is intended for professional and technical personnel who are involved in operational programs of groundwater quality control.

The course is designed to provide information on the concepts of geology and hydrology in relation to groundwater. Knowledge of the influence or restraint of geologic formations and structures on the occurrence, movement and quality of groundwater is acquired through the use of illustrated lectures.

Field and laboratory methods and instrumentation for acquiring necessary data on various physical and chemical parameters are investigated and studied. Social, economic and legal aspects of groundwater utilization are discussed.

This course provides both background and introduction to the more advanced course on "Pollution Problems Related to Groundwater" (169). It is prerequisite for admission to course 169 unless the applicant has had equivalent training and/or experience.

POLLUTION PROBLEMS RELATED TO GROUNDWATER (169)

1 week

ADA, OKLAHOMA **January 29-February 2, 1968**

This course is intended for engineers, geologists and other scientists responsible for planning and administering programs and projects involving groundwater utilization, subsurface waste disposal or other involvement of the subsurface water resource.

A thorough knowledge of basic principles of geology and groundwater hydrology is essential, and registrants for this course should complete the course "Geohydrologic Relationships in Water Pollution" (168) or have equivalent experience and/or education.

Pollution problems will be considered in terms of: the nature and known extent of the problem; methodology of investigation, analysis and evaluation; review of reported experience in corrective actions; discussion of possible procedures for control and/or abatement.

Problem areas to be covered include:

Natural salt pollution
Irrigation return flows
Groundwater recharge
Salt water intrusion
Deep well disposal of oil-field brines and industrial wastes.

DATA ANALYSIS AND EVALUATION IN WATER POLLUTION STUDIES (171)

1 week

ADA, OKLAHOMA **February 26-March 1, 1968**

ATHENS, GEORGIA **April 8-12, 1968**

The course is planned for personnel responsible for administration, planning and supervision of projects involving water pollution control. Analysis and evaluation of data is an integral operation in the solution of problems related to water pollution and one that depends heavily on the highly sophisticated methodology and manipulative techniques of mathematical statistics. To successfully utilize this complex scientific tool, it is essential that professional personnel concerned with water pollution problems have a thorough understanding of the planning and procedural constraints essential to valid statistical analysis of any accumulation of data.

Instruction concentrates on fundamental relationships between field and laboratory operational procedures and subsequent statistical evaluation of collected data. Basic concepts of variation in mathematical functions are related to physical and envi-

ronmental parameters under investigation as a basis for development of a mathematical model of a system.

Understanding of the potentials for, and limitations of, data analysis and evaluation is developed in relation to the responsibilities of the various scientific disciplines concerned. The mathematical manipulative techniques and theories essential to performance of statistical operations however, are not included in this course.

Subject areas include:

- Prerequisites of program planning
- Factors that determine whether data is amenable to statistical analysis
- Definitions of significant terminology
- Statistical methodology and procedure of application to program development
- A mathematical model for a system - development, modification and utilization

A background of advanced mathematics is beneficial but not prerequisite to this course.

PHYSICAL-CHEMICAL TREATMENT OF WASTEWATERS AND SLUDGES (172)

2 weeks

CINCINNATI, OHIO **December 4-15, 1967**

This course is offered for engineers, chemists, scientists, and other professional personnel concerned with selection, design, and control of physical and chemical methods of wastewater treatment. Biological treatment methods are considered in another course. Trainees attend lectures and demonstrations and perform detailed laboratory experiments which emphasize treatment principles and economics. Since approximately 50 percent of class time is spent in the laboratory, a working knowledge of sanitary engineering chemistry is desirable. Considerable time is spent in interpretation of laboratory results.

Major subject areas of the course include flocculation, mixing, sedimentation, flotation, incineration, vacuum filtration, solids concentration, sludge-drying, chemical oxidation, separation of emulsions, adsorption and absorption, cooling and psychrometric techniques, corrosion control, screening, neutralization, ion exchange, and electrodialysis. A section of the course considers advanced waste treatment processes developed for removal of refractory materials which are resistant to or even totally unaffected by today's best conventional water and waste treatment processes.

This is a new course especially developed to illustrate physical and chemical methods for treating troublesome industrial wastes. Nearly all the laboratory experiments are performed using actual industrial wastes. The course is a companion course to "Biological Treatment of Wastewaters and Sludges" (162).

BASIC PRINCIPLES OF WASTEWATER TREATMENT OPERATION (173)

CINCINNATI, OHIO **Date to be announced**

This course is offered for treatment plant operating personnel seeking a general orientation in:

- Characteristic effects of wastewaters upon water quality
- Treatment operations used to remove objectionable pollutants
- Basic factors of operational control and maintenance
- Essentials of testing plant performance and reporting results
- The operator's function in water pollution control

This course is recommended also for those individuals in state and regional programs who are responsible for designing and conducting operator training courses.

Treatment facilities will be presented in terms of unit operations such as collection, pumping, clarification, mixing, flocculation, aeration, oxidation, and incineration. Engineering applications of these will be combined into processes in terms of the biological, chemical or physical behavior. Typical plant schematic diagrams will be used to facilitate recognition of plant units, their function, and care. The same schematics will be used in presentation of basic tests, and calculations involving flow, concentration and loading as used for plant operational reports.

The teamwork approach will be stressed among the operator, his associates, his supervisors, his public, and local, state or regional agencies with respect to the services and information expected from him and the nature of assistance that he may obtain from others.

SEMINAR ON THE FWPCA: STRUCTURE AND FUNCTION (174)

3 days

CINCINNATI, OHIO **September 27-29, 1967**

This seminar is offered for professional and technical personnel of the Federal Water Pollution Control Administration and individuals new to the field of water pollution control. It is intended primarily for Federal personnel, but may be attended by individuals from state and local agencies interested in the activities of the Administration.

The presentation is developed in two sections, the first of which is concerned with the specific activities of FWPCA, its organizational structure, and its function within the overall governmental

structure. The second section provides information on general Administration policies and procedures.

Major subject areas include the function of FWPCA within the Department of the Interior, FWPCA organizational structure, functions of regional water laboratories, regional basin office programs, technical facilities, research and development, and enforcement programs, interagency relationships, personnel administration, and general administrative matters such as clearance of reports, travel, and operation details.

STATISTICAL METHOD-EVALUATION AND QUALITY CONTROL FOR THE LABORATORY* (851)

1 week

CINCINNATI, OHIO **August 28-September 1, 1967**
March 18-22, 1968

This course is designed for analysts responsible for evaluating methods and for supervisors desiring to maintain a quality control program on laboratory analyses.

The objective of the course is to enable the trainees to understand and apply principles of statistical method evaluation and quality control. It will enable the trainee to evaluate analytical procedures regarding the precision and accuracy of the method, the identification, quantification, and control of errors using both non-statistical and statistical techniques.

Laboratory development of methods as to sensitivity, simplicity, specificity, etc. will not be discussed. These techniques will be applied to both intra-lab and inter-lab problems in the fields of air pollution, water pollution, milk and food, and radiological health.

Course topics include:

- Basic concepts of statistics
- Types of errors
- Methods for eliminating determinate errors
- Measuring uncontrollable errors
- Measures of precision and accuracy
- Principles of quality control
- Statistical quality control
- Control chart techniques
- Inter-lab quality control
- Statistical techniques used in method selection and evaluation

*Conducted jointly by the staffs of the National Centers for Radiological Health, Air Pollution, and Urban and Industrial Health of the Bureau of Disease Prevention and Environmental Control, Public Health Service, U.S. Department of Health, Education, and Welfare; and the staff of the Federal Water Pollution Control Administration, U.S. Department of the Interior.

SEMINAR ON WATER POLLUTION CONTROL PROBLEMS (199)

1 day

FIELD Dates and locations to be negotiated with the Laboratory offering the training.

This seminar is designed for local and regional governmental elected officials, representatives from civic organizations, and "action groups" concerned with state, regional, and local water pollution control problems.

It is intended to acquaint the individual with the factors involved in the interrelationships of water quality standards and the national water pollution control program. It is intended further to assist local officials in providing information on implementing programs of water pollution control under existing Federal legislation through joint technical and financial assistance from the Federal Water Pollution Control Administration.

The location and date for the one-day seminar may be arranged through the Training Officer of the Water Laboratory offering the training.

Ada, Oklahoma
Athens, Georgia
Cincinnati, Ohio
College, Alaska
Corvallis, Oregon
Metuchen, New Jersey

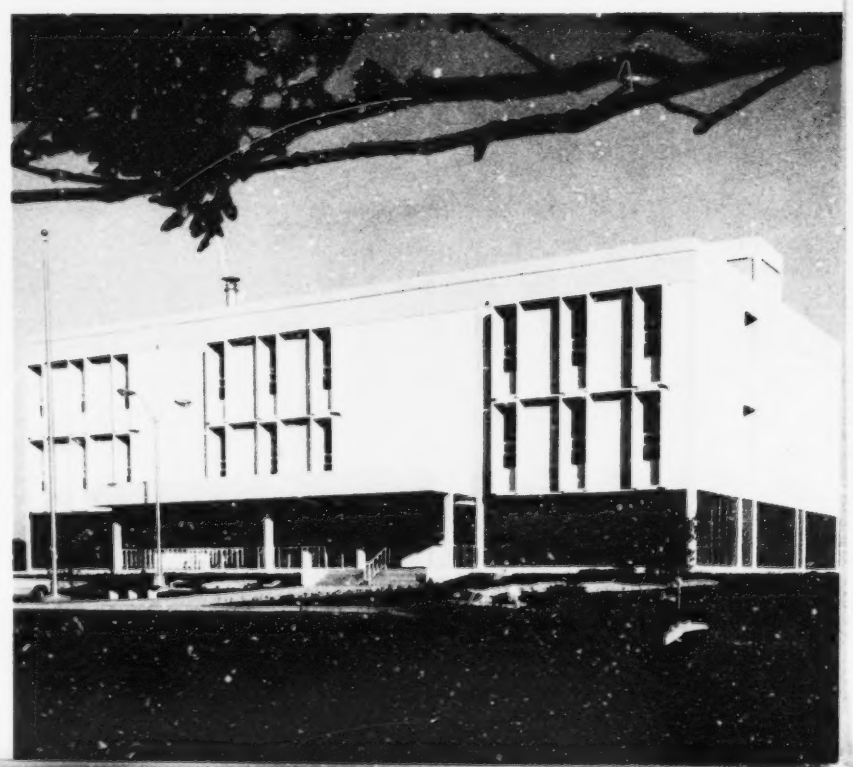
FEDERAL
WATER
POLLUTION
CONTROL
ADMINISTRATION
FACILITIES

offering

Water Pollution Control Training

Ada, Oklahoma

The Robert S. Kerr Water Research Center



Preceding page blank 27

THE ROBERT S. KERR WATER RESEARCH CENTER is one of seven regional laboratories authorized by the U. S. Congress in 1961 to move in the vanguard of the scientific and technical attack on water pollution problems. Named for the late senator from Oklahoma and located near his birthplace on a wooded hilltop three miles south of Ada, Oklahoma, the Center serves all states within the Arkansas-White-Red River Basin and the Gulf of Mexico Basin west of the Mississippi River.

The three-storied Center contains 50,000 square feet of office and laboratory space and will be staffed by a complement of 150 professional specialists and ancillary personnel. The building was completed for occupancy in February of 1966 and was dedicated in ceremonies held on May 29, 1966.

Functions of the Center are conducted under three operational Programs - Research, Technical Services, and Training. Close coordination and interdisciplinary support in all program activities assures that the total service of the Center, to the region and the Nation, will be of maximum benefit in the preservation and enhancement of water quality for all beneficial uses.

The Research Program of the Kerr Center will be directed to pollution problems of particular significance in, but not necessarily unique to, the south-central region. These include research in: water quality as affected by impoundments, industrial waste control, conservation practices, control of runoff, soils treatment and salt water intrusion; groundwater recharge, effects of underground disposal of wastes, and the fate of pollutants in ground water; and methods of treatment and control of farm wastes, petroleum and chemical wastes, and irrigation return flows.

The primary functions of the Technical Services Program are assistance to State and local agencies in the solution of water pollution problems and investigations to determine precisely the existing quality of the surface and groundwater resources of the region. The baseline of present water quality will be an important factor in the development, by the various States, of acceptable standards for the control and abatement of pollution.

The Training Program makes possible the early application of new theories and techniques in the detection, evaluation and control of water pollution, as established by the Research and Technical Services Programs, through development and presentation of intensive short-term courses on specific problems Lectures, demonstrations, laboratory exercises and field practice are designed to develop maximum capability in performance and application of new methods and theories as well as of established practices of water pollution control.

COURSES TO BE OFFERED AT THE ROBERT S. KERR WATER RESEARCH CENTER
Ada, Oklahoma

Chemical Analyses for Water Quality (100) . . . . . September 18-29, 1967

Applications of Biological Principles in Water Pollution Control (146) . . . . . November 6-8, 1967

Water Quality Studies (161) . . . . . Nov. 27 - Dec. 8, 1967

Geohydrologic Relationships in Water Pollution (168) . . . . . January 22-26, 1968

Pollution Problems Related to Groundwater (169) . . . . . Jan. 29 - Feb. 2, 1968

Data Analysis and Evaluation in Water Pollution Studies (171) . . . Feb. 26 - Mar. 1, 1968

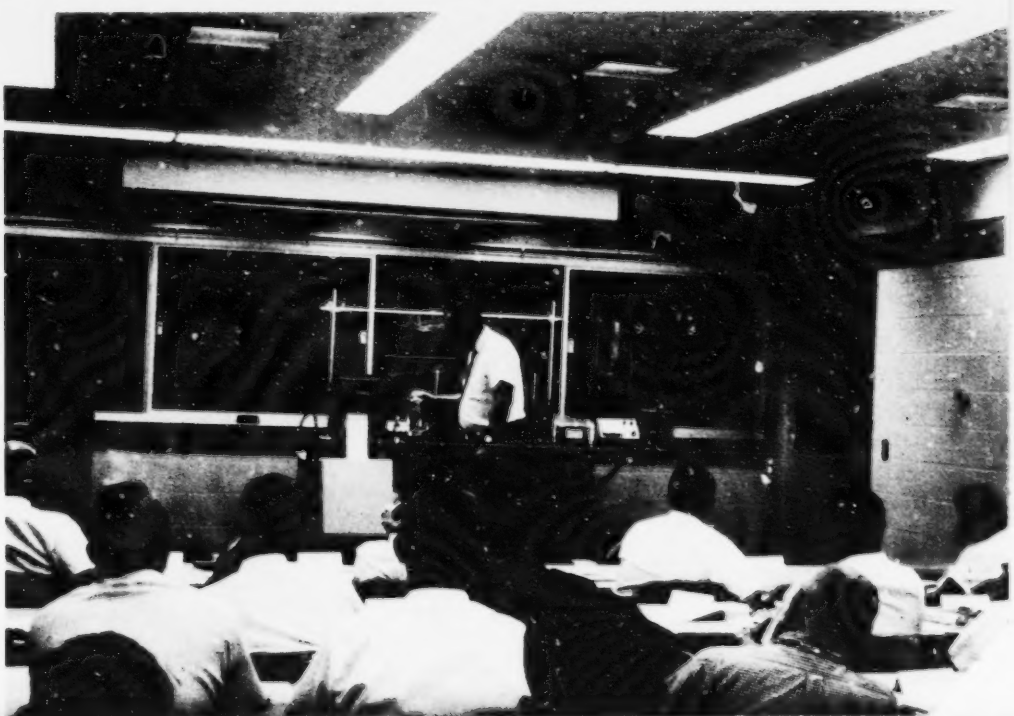
Freshwater Biology and Pollution Ecology (140) . . . . . Mar. 25 - Apr. 5, 1968

Freshwater Pollution Ecology (143) . . . . . April 1-5, 1968

Current Practices in Water Microbiology (120) . . . . . May 6-17, 1968

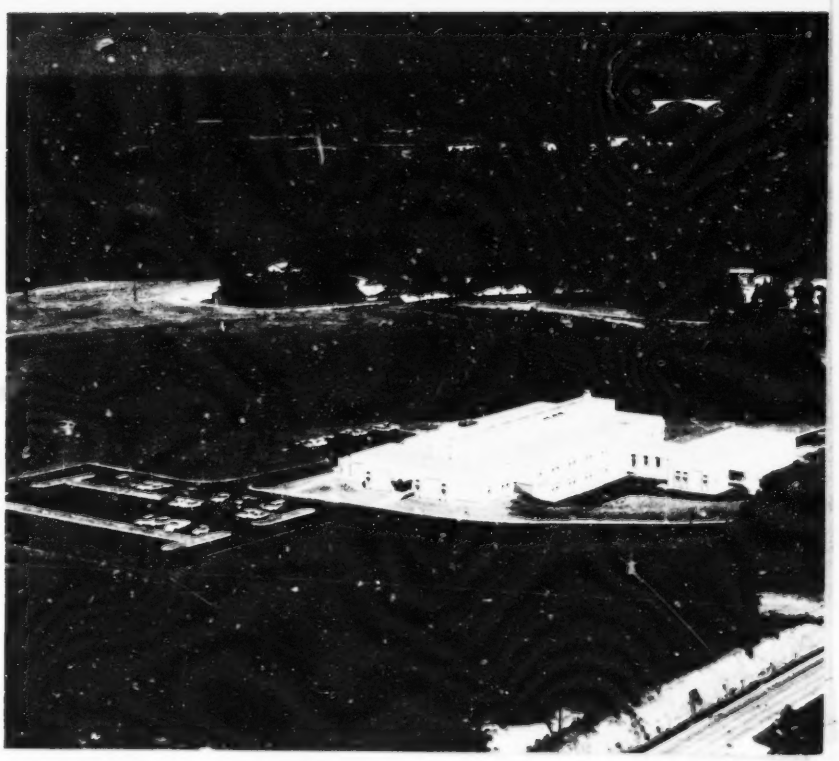
Class Field Survey

Direct Extraction of Pesticide
Samples in Classroom at Ada, Oklahoma



Athens, Georgia

Southeast Water Laboratory



THE SOUTHEAST WATER LABORATORY is located in Athens, Georgia near the University of Georgia. The main laboratory building is located on 12 acres of land donated by the University of Georgia to the United States, in an area dedicated to research facilities. Two other research laboratories are currently operating in this research park and an agricultural products utilization laboratory is presently being constructed contiguous to the Southeast Water Laboratory.

The main laboratory building has a floor area of approximately 50,000 square feet including two, one-story wings providing space for executive and administrative offices and training activities respectively. The main two-story laboratory building is designed with a central core providing complete mechanical and utility services to the laboratories which surround it. Offices for the professional staff, supporting services and the laboratory library are provided on the perimeter of the main building. The Laboratory was completed and occupied in April, 1966, with formal dedication ceremonies occurring on May 6, 1966. The principal speaker at the dedication was Senator Richard B. Russell of Georgia. Prior to the completion of the new laboratory, an auxiliary building, located on land provided by the City of Athens, Georgia, provided space for the Southeast Water Laboratory. The new laboratory building cost $2,500,000 and equipment costs will be approximately $1,500,000.

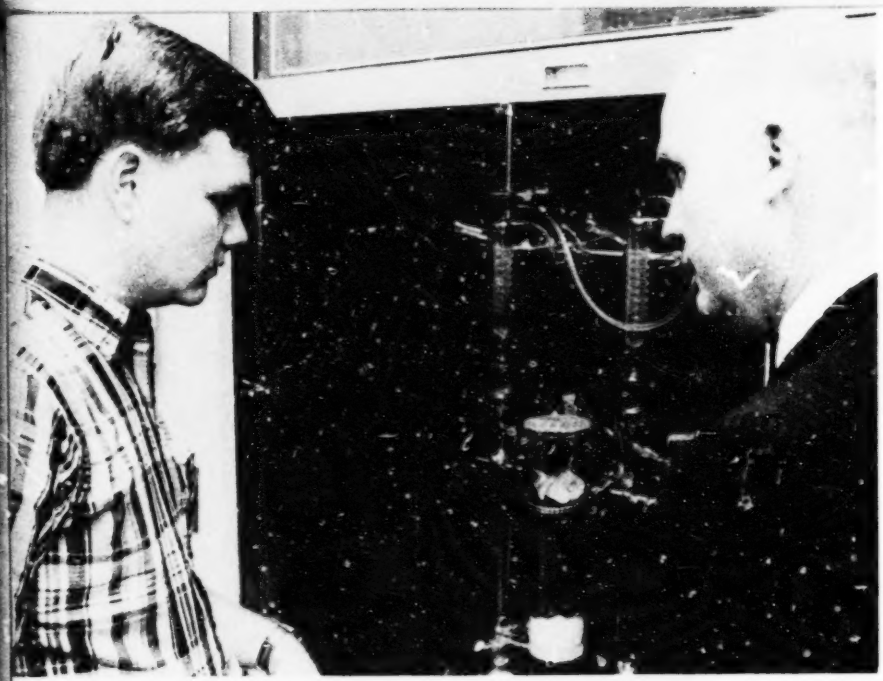
The major areas of activity for the Southeast Water Laboratory are research, technical assistance and training. The training activities are housed in one wing of the Laboratory, adjacent to one of the parking lots. The facilities include a lecture room and adjoining projection room equipped with various movie and slide projectors, tape recorders and other audio-visual aids with dual operation provided for these items by either the lecturer or projectionist. A training laboratory with full facilities for 24 students, a preparation laboratory supporting both the lecture room and the training lab and a separate instrument training laboratory complete the training facilities. Offices for the training staff and the Laboratory's lunch room are adjacent to the training facility.

When fully staffed the Southeast Water Laboratory will employ approximately 150 persons engaged in research, investigations, experiments, field demonstrations and studies, and training related to the prevention and control of water pollution. This work will be carried out in one of the most modern facilities of its kind in the United States.

COURSES TO BE OFFERED AT THE SOUTHEAST WATER LABORATORY
Athens, Georgia

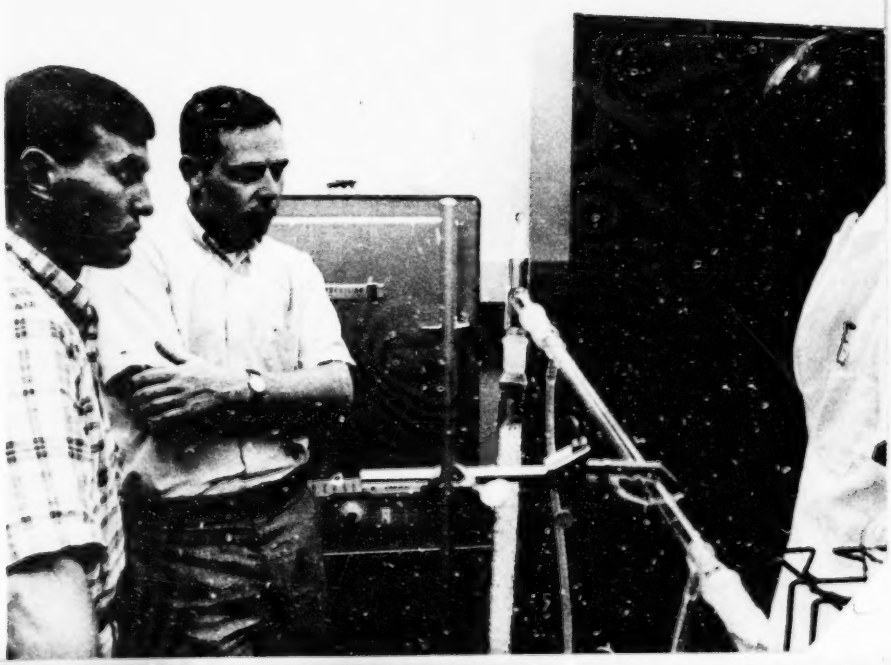
Analysis of Pesticides in the Aquatic Environment (103)	Jan. 22 - Feb. 2, 1968
Data Analysis and Evaluation in Water Pollution Studies (171)	April 8-12, 1968
*Marine Biology and Pollution Ecology (144)	Apr. 29 - May 10, 1968
*Marine Pollution Ecology (145)	May 6-10, 1968
Applications of Biological Principles in Water Pollution Control (146)	May 13-15, 1968
Water Quality Studies (161)	June 17-28, 1968
Seminar on Water Pollution Control Problems (199)	Through Special Arrangement With the Water Laboratory

*At a field location to be announced later by the Water Laboratory



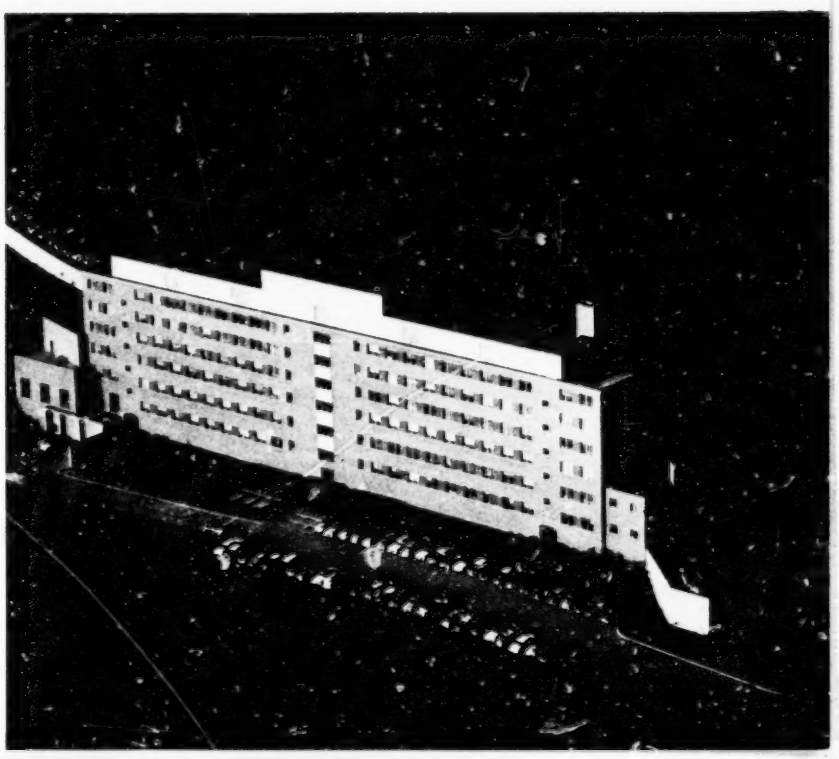
Carbon Extraction Equipment
at Athens, Georgia

Trainees Observe Solvent
Purification Demonstration



Cincinnati, Ohio

The Robert A. Taft Sanitary Engineering Center



35

THE ROBERT A. TAFT SANITARY ENGINEERING CENTER plays a prominent national and regional role in water pollution control. Between the first temporary Federal pollution legislation in 1948 and the Clean Water Restoration Act of 1966, emphasis shifted from the remedial approach of cleaning up waters to the positive approach of maintaining the Nation's waters at the highest quality possible through the prevention of pollution.

With its increased concern over the pollution of the Nation's water resources, the Federal Government has taken steps to detect, prevent or abate water pollution due to industrial and population growth. Under the Federal Water Pollution Control Administration of the U. S. Department of the Interior, laboratories have been established in regions of the Nation where distinct pollution problems are particularly formidable. The monitoring, detection, and surveillance of such waters are performed in these laboratories and collected into comprehensive data records. The Robert A. Taft Sanitary Engineering Center located at Cincinnati, in the Ohio Basin Region, is one of the regional water laboratories operated by the Administration.

Within the Ohio Basin Region, the efforts of the Federal Water Pollution Control Administration are accomplished through:

Research on industrial and municipal waste-treatment processes

Comprehensive technical progress

Grants to assist communities to construct waste-treatment facilities

Establishment of water quality standards

Enforcement of quality standards when the states fail to establish standards of their own or do not enforce them, and

Training courses which will enable other Federal, state, interstate and local agencies, industry, universities, and others to acquire the latest techniques in evaluating and controlling water pollution.

Through the training effort, the latest research findings are communicated to those in the field for immediate application. Training shortens the time gap between research finding and field application of new techniques applicable to water pollution control.

In addition, national programs of Technical Assistance, Water Quality Surveillance, and Training are located within the Ohio Basin Region.

Scientists and engineers in increasingly growing numbers visit the Center annually seeking training and consultation. Many of these visitors are in this country for advanced training at colleges and universities under the auspices of the Agency for International Developement or the United Nations World Health Organization. Because their programs usually include tours of the major Water Pollution Control installations of the Adminstration, they quite naturally gravitate to the Center. In general, their aims are the same- to bring back to their countries the latest knowledge.

Recognizing the importance of appropriate use of the visitor's time at the Center, detailed schedules of training and consultation are arranged according to the interests and needs of the individuals.

COURSES TO BE OFFERED AT THE ROBERT A. TAFT SANITARY ENGINEERING CENTER
Cincinnati, Ohio

Plankton Analysis for Treatment Plant Operators (142). . . . . July 10-14, 1967

Water Quality Studies (161). . . . . July 24 - Aug. 4, 1967

Chemical Analyses for Water Quality (100). . . . . August 14-25, 1967

Statistical Method-Evaluation and Quality Control for the Laboratory (851). . . . . Aug. 28 - Sept. 1, 1967

Seminar on the FWPCA: Structure and Functions (174) . . . . . September 27-29, 1967

Freshwater Biology and Pollution Ecology (140). . . . . October 9-20, 1967

Freshwater Pollution Ecology (143). . . . . October 16-20, 1967

Laboratory Analyses for Treatment Plant Operators (105). . . . . Oct. 23 - Nov. 3, 1967

Physical-Chemical Treatment of Wastewaters and Sludges (172). . . . . December 4-15, 1967

Current Practices in Water Microbiology (120) . . . . . January 8-19, 1968

Applications of Biological Principles in Water Pollution Control (146). . . . . January 22-24, 1968

Orientation to Automated Instrumentation in Water Pollution Surveillance (106) . . . . . Jan. 29 - Feb. 2, 1968

Biological Treatment of Wastewaters and Sludges (162). . . . . February 5-16, 1968

Freshwater Pollution Ecology (143). . . . . Feb. 26 - Mar. 1, 1968

Analysis of Pesticides in the Aquatic Environment (103) . . . . . March 4-15, 1968

Membrane Filter Methods for Treatment Plant Operators (121) . . . March 18-22, 1968

Statistical Method-Evaluation and Quality Control for the Laboratory (851) . . . . . March 18-22, 1968

STORET System for Data Handling in Water Pollution Control (167). . . . . March 25-29, 1968

Laboratory Analyses for Treatment Plant Operators (105). . . . . April 1-12, 1968

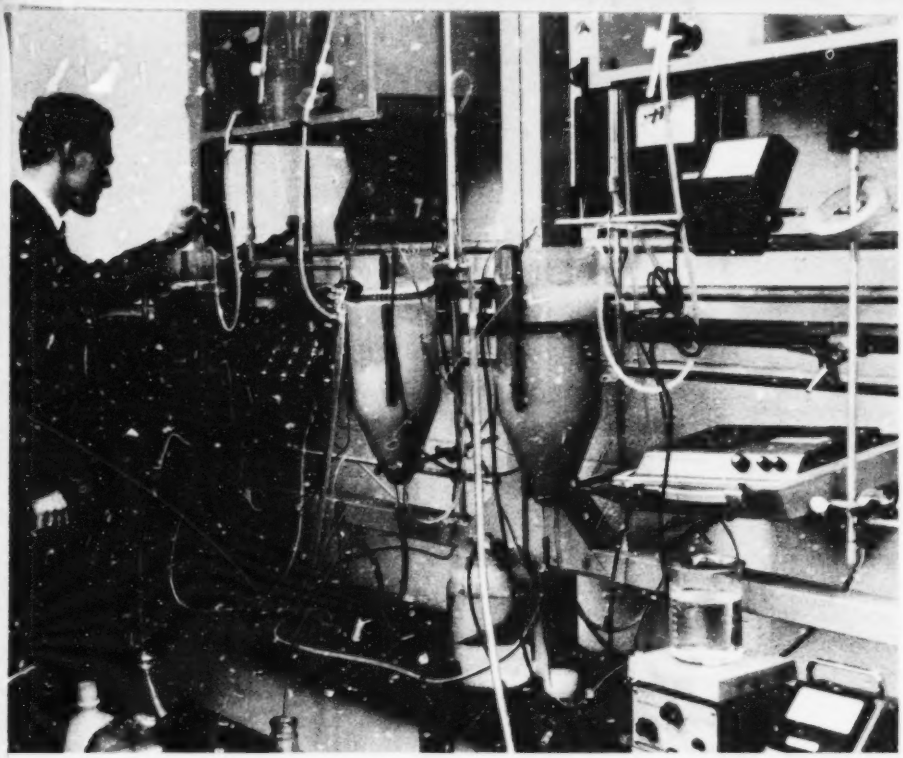
Chemical Analyses for Water Quality (100). . . . . Apr. 22 - May 3, 1968

Plankton Analysis (141). . . . . June 3-14, 1968

Operation of Automated Instrumentation in Water Pollution Surveillance (107). . . . . Date to be Announced

Basic Principles of Wastewater Treatment Operation (173) . . . . . Date to be Announced

Seminar on Water Pollution Control Problems (199) . . . . . Through Special Arrangement With the Water Laboratory



Bench-scale Treatment of Wastes
in Cincinnati Laboratory

Microscopic Examination of
Organisms in Wastewater

College, Alaska

Alaska Water Laboratory

THE ALASKA WATER LABORATORY is located on the University of Alaska campus at College, Alaska.

Alaska, with a land area of 586,400 square miles, lies within three climatic zones; arctic, sub-arctic and marine. Annual precipitation variations extend from four inches to 200 inches. Temperature extremes range from -80° F. to +100° F. Summers have long days of sunshine (continuous north of Arctic Circle) while the winters have short periods of sunshine (none north of Arctic Circle). Permafrost layers varying in depth up to 2,500 feet, muskegs, tundra, glacial feeding of streams, high water tables, etc. create specialized problems of waste preparation for introduction into the Alaskan environment. Water resources in the State, including many thousand lakes, over 20,000 miles of rivers, and greater than 30,000 miles of coast line, are a valuable asset. Water pollution in the State must be prevented or reduced to acceptable levels in the presence of the State's increasing rates of industrial and commercial growth.

Considerable industrial expansion is expected, examples are: timber (600 million board feet annual harvest by early 1970's), petroleum (over 300,000 barrels per day by early 1970's), and fisheries (1966 production of 365 million pounds).

Through applied research, the Alaska Water Laboratory is extending temperature climate treatment processes to cold regions application, while actively developing new processes particularly suitable to Alaska conditions. Influences of wastes, treated and untreated, on Alaska's water resources are being evaluated.

Because of the geographical location of Alaska, there are a large number of Federal installations scattered throughout the State.

The Training Branch, Alaska Water Laboratory, will offer courses oriented toward the water pollution control needs of Federal, State, and local governmental agencies, and private industry. Courses will range from very basic treatment plant operator short courses to highly specialized technical courses aimed to assist specialists.

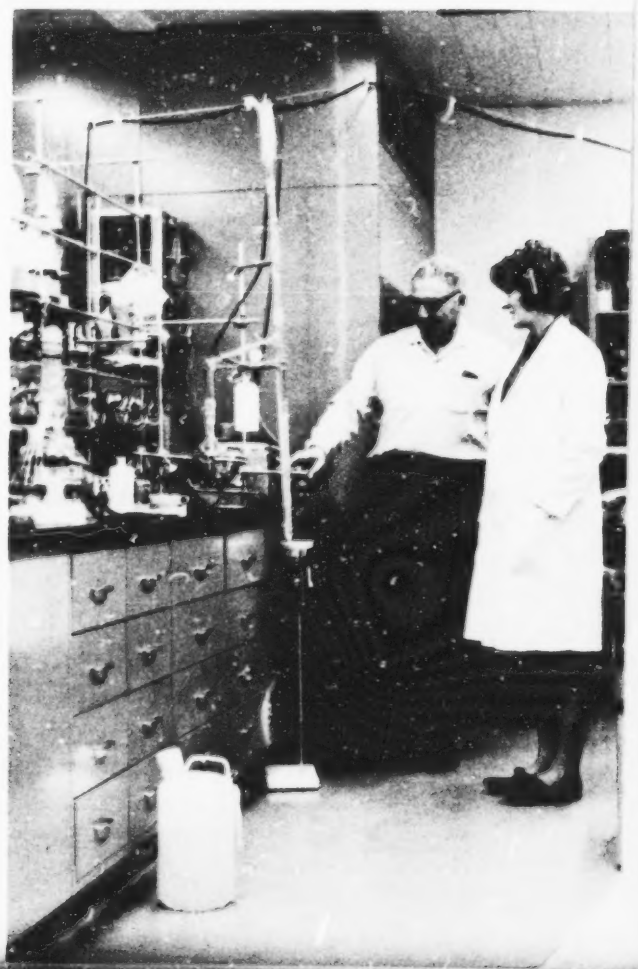
Course schedules will be made available through the Training Officer, Alaska Water Laboratory, College, Alaska, 99701.

ALASKA WATER LABORATORY
College, Alaska

During Fiscal Year 1968, a limited number of Water Pollution Control Training courses may be arranged for presentation in Alaska through the Alaska Water Laboratory, College, Alaska by contacting the Chief of Training at the Laboratory.

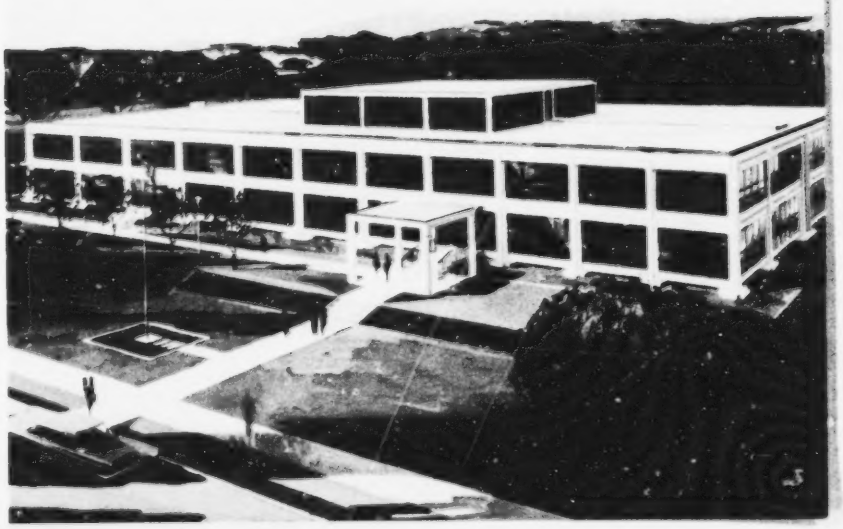
Stock Tanks for
Fish Tolerance Test—
College, Alaska

Apparatus for Classification
of Organic Pollutants



Corvallis, Oregon

Pacific Northwest Water Laboratory



K3

THE PACIFIC NORTHWEST WATER LABORATORY at Corvallis, Oregon, constructed in 1966 by the U. S. Department of the Interior, will play an important role in combatting water pollution in the Northwest.

Unlike many other sections of the country, the waters of the Northwest have not, for the most part, been contaminated and despoiled by pollution. Nevertheless, it is apparent that the same forces of population increase, urbanization, and industrial growth which normally cause pollution are at work. Unless drastic steps are taken, the same results will occur in the Pacific Northwest.

While the research programs at the Pacific Northwest Water Laboratory are designed to solve difficult problems of the Northwest, the Laboratory's efforts also are an essential component of the total national research activity. Research currently is under way in six problem areas. Objectives are to develop needed new knowledge and technology to: (1) permit rescuing waters from advancing stages of eutrophication and preserve waters still relatively unaffected, (2) provide acceptable waste-handling and treatment and pollution-preventive processes for pulp and paper, potato processing, and other significant industries, (3) permit harvesting and utilizing timber resources on watersheds without concurrent deterioration of water quality, (4) prevent undesirable water quality changes during reservoir storage and water resources facility operations, (5) protect estuaries and coastal waters from ravages of pollution, and (6) utilize systems analysis techniques to forecast and prevent problems of heat pollution.

The technical assistance program seeks to convert knowledge gained through research into useful practice, and to supply such assistance as other agencies may require to solve some of their own complex water pollution problems. Some of the technical assistance projects now under way include: (1) development of criteria for effective use of surface aeration in industrial water oxidation ponds, (2) development of best methods for treatment of glue wastes resulting from the manufacture of plywood, (3) examining the nature and effects of wastes from cane sugar mills on water quality, and (4) evaluating the characteristics and effects of wastes from ocean-going vessels, houseboats, and pleasure water craft. Short-term, emergency surveys and consultation requested by other Federal, State, and local agencies are provided by the technical services staff.

The Training Program offers courses in water pollution control geared specifically to the needs of the Pacific Northwest. New techniques or procedures developed by the laboratory and elsewhere are promptly shared through courses or seminars.

COURSES TO BE OFFERED AT THE PACIFIC NORTHWEST WATER LABORATORY Corvallis, Oregon

Membrane Filter Methods for Treatment Plant Operators (121) . . . . . September 11-15, 1967

Water Quality Studies (161) . . . . . October 9-20, 1967

Laboratory Analyses for Treatment Plant Operators (105). . . . . November 6-17, 1967

Chemical Analyses for Water Quality (100) . . . . . January 8-19, 1968

Freshwater Biology and Pollution Ecology (140). . . . . March 4-15, 1968

Marine Biology and Pollution Ecology (144). . . . . May 6-17, 1968

Marine Pollution Ecology (145) . . . . . May 13-17, 1968

Sampling for the Lumber Industry

Industrial Use of Water
in the Pacific Northwest

Metuchen, New Jersey

Northeast Region Project Office

47

THE NORTHEAST REGION PROJECT OFFICE of the Federal Water Pollution Control Administration is located in the heart of the New Jersey research complex. Metuchen is situated thirty miles from New York City, twenty miles from Princeton, and five miles from New Brunswick, the home of Rutgers University.

In support of the National Training Program of the Federal Water Pollution Control Administration, courses are held at this project facility. The installation serves as a subregional office of the Northeast Regional Headquarters located in Boston, Massachusetts. In this capacity, it is responsible for Administration operations in portions of the States of New York, New Jersey, and Pennsylvania and the entire State of Delaware. Among the varied functions are the Construction Grants Program, the Federal Facilities Program and regional laboratory operations.

Metuchen serves as the headquarters and base of operations of the Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project. This activity covers an area of twenty square miles, extending from southern New Jersey to the Canadian border and covering some of the most heavily populated sections of the United States. The Project's staff includes a large variety of professional disciplines and it maintains a large well-equipped laboratory. The Hudson-Champlain Project conducts an exhaustive study of water pollution control problems in its area. The entire professional staff of the Project and the laboratory are available to the National Training Program. Thus, any form of field training in water pollution control can be provided in Metuchen.

COURSES TO BE OFFERED AT THE NORTHEAST REGION PROJECT OFFICE
Metuchen, New Jersey

Water Quality Studies (161) . . . . . .September 11-22, 1967

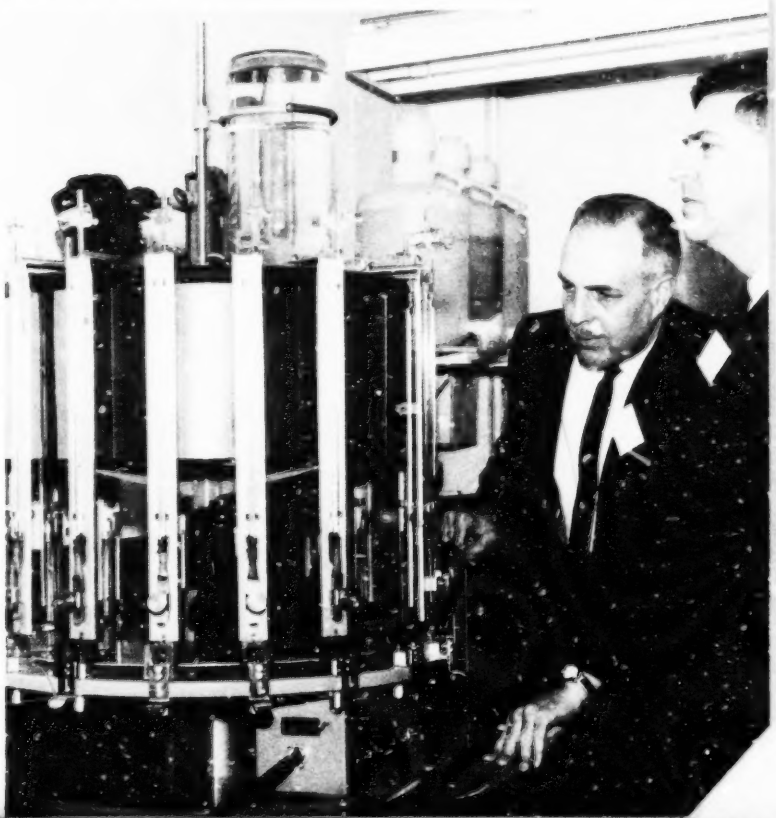
Chemical Analyses for Water Quality (100) . . . . . .November 6-17, 1967

Current Practices in Water Microbiology (120) . . . . . February 5-16, 1968

Seminar on Water Pollution Control Problems (199) . . . . . .Through Special Arrangement With the Water Laboratory

Nitrogen Determination Apparatus
at Metuchen, New Jersey

Warburg Apparatus — Respiration Testing



Applications

Applicants should apply directly
to the Laboratory offering the course desired.

U.S. DEPARTMENT OF THE INTERIOR

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

Federal Water Pollution Control Administration
Training Program

APPLICATION FOR TRAINING

I. NAME OF APPLICANT:

Mr.
Mrs.
Miss _____
(first) (middle initial) (last)

II. COURSE DESIRED:

Title _____ Course No. _____

Place where given _____ Dates _____

FWPCA Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT (If different from above):

_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____

VI. PREVIOUS WATER POLLUTION CONTROL TRAINING COURSES ATTENDED:

Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

_____ _____

Signature of Approving Officer (Where Applicable) *Signature of Applicant*

_____ _____

Title *Date*

MAIL TO THE FWPCA OFFICE CONDUCTING THE TRAINING COURSE

Training Activities, FWPCA
Robert S. Kerr Water Research Center
P.O. Box 1198
Ada, Oklahoma 74820

Training Activities, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati, Ohio 45226

Training Activities, FWPCA
Northeast Region
Metuchen, New Jersey 08840

Training Activities, FWPCA
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

Training Activities, FWPCA
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

U.S. DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration
Training Program

APPLICATION FOR TRAINING

I. NAME OF APPLICANT:

Mr.
Mrs.
Miss _____
(first) (middle initial) (last)

II. COURSE DESIRED:

Title _____ Course No. _____

Place where given _____ Dates _____

FWPCA Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT (If different from above):

_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____

VI. PREVIOUS WATER POLLUTION CONTROL TRAINING COURSES ATTENDED:

Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

Signature of Approving Officer (Where Applicable)	*Signature of Applicant*
Title	*Date*

MAIL TO THE FWPCA OFFICE CONDUCTING THE TRAINING COURSE

Training Activities, FWPCA
Robert S. Kerr Water Research Center
P.O. Box 1198
Ada, Oklahoma 74820

Training Activities, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati , Ohio 45226

Training Activities, FWPCA
Northeast Region
Metuchen, New Jersey 08840

Training Activities, FWPCA
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

Training Activities, FWPCA
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

FWPCA-97 (2-67) (Reverse)

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

U.S. DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration
Training Program

APPLICATION FOR TRAINING

I. NAME OF APPLICANT:

Mr.
Mrs.
Miss _____
(first) (middle initial) (last)

II. COURSE DESIRED:

Title _____ Course No. _____

Place where given _____ Dates _____

FWPCA Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT (If different from above):

_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____

VI. PREVIOUS WATER POLLUTION CONTROL TRAINING COURSES ATTENDED:

Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

_____	_____
Signature of Approving Officer (Where Applicable)	*Signature of Applicant*
_____	_____
Title	*Date*

MAIL TO THE FWPCA OFFICE CONDUCTING THE TRAINING COURSE

Training Activities, FWPCA
Robert S. Kerr Water Research Center
P.O. Box 1198
Ada, Oklahoma 74820

Training Activities, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati, Ohio 45226

Training Activities, FWPCA
Northeast Region
Metuchen, New Jersey 08840

Training Activities, FWPCA
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

Training Activities, FWPCA
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601

FORM APPROVED
BUDGET BUREAU
NO. 42-R1506

U.S. DEPARTMENT OF THE INTERIOR

Federal Water Pollution Control Administration
Training Program

APPLICATION FOR TRAINING

I. NAME OF APPLICANT:

Mr.
Mrs.
Miss _____ _____ _____
(first) (middle initial) (last)

II. COURSE DESIRED:

Title _____ Course No. _____

Place where given _____ Dates _____

FWPCA Training Office conducting course _____

III. SPONSOR OR EMPLOYER:

Name of Organization or Firm _____

Address _____

_____ Phone _____

IV. MAILING ADDRESS OF APPLICANT (If different from above):

_____

_____ Phone _____

V. PROFESSIONAL STATUS:

Profession or Occupation _____

Position Title _____

Brief description of your present position _____

_____

_____

_____

Total years experience in profession _____

VI. PREVIOUS WATER POLLUTION CONTROL TRAINING COURSES ATTENDED:

Titles	Dates	Location

VII. EDUCATION:

High School Graduate: Yes ____ No ____

Number of years education completed beyond high school _____

College or University	Date attended	Major	Degree

VIII. SIGNATURES:

_____ _____

Signature of Approving Officer (Where Applicable) *Signature of Applicant*

_____ _____

Title *Date*

MAIL TO THE FWPCA OFFICE CONDUCTING THE TRAINING COURSE

Training Activities, FWPCA
Robert S. Kerr Water Research Center
P.O. Box 1198
Ada, Oklahoma 74820

Training Activities, FWPCA
Robert A. Taft Sanitary Engineering Center
4676 Columbia Parkway
Cincinnati, Ohio 45226

Training Activities, FWPCA
Northeast Region
Metuchen, New Jersey 08840

Training Activities, FWPCA
Pacific Northwest Water Laboratory
200 S. 35th Street
Corvallis, Oregon 97330

Training Activities, FWPCA
Southeast Water Laboratory
College Station Road
Athens, Georgia 30601